1. In a processing device associated with a display device, wherein the display device has a plurality of pixels each having a plurality of pixel sub-components, a method of processing image data in preparation for displaying an image on the display device such that the pixel sub-components represent different portions of the image and the image is rendered with a desired degree of luminance accuracy and a corresponding desired degree of color accuracy, the method comprising the steps for:

passing a signal in which the image data is encoded through a low-pass filter, the signal having a plurality of channels each representing a different color component of the image; and

based on the filtered signal, generating a data structure in which data representing spatially different regions of the image data are mapped to individual pixel sub-components of a particular pixel rather than being mapped to the entire pixel.

2. A method as recited in claim 1, wherein the effective sampling rate is one sample per pixel sub-component, and wherein the low-pass filter has a cutoff frequency greater than the pixel Nyquist frequency, the Nyquist frequency having a value of one-half cycle per pixel.

3. A method as recited in claim 2, wherein the value of the cutoff frequency of the low-pass filter is greater than the pixel Nyquist frequency and less than one cycle per pixel.

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4. A method as recited in claim 3, wherein the value of the cutoff frequency of the low-pass filter is in a range from about 0.6 cycles per pixel to about 0.9 cycles per pixel.

5. A method as recited in claim 1, wherein each of the plurality of pixels has three pixel sub-components, and wherein the low-pass filter comprises nine filters applied to the signal to generate the data representing the spatially different regions of the image data.

6. A method as recited in claim 1, further comprising the step for selecting the filtering coefficients of the low-pass filter to establish a desired tradeoff between color accuracy and luminance accuracy.

7. A method as recited in claim 6, wherein the step for selecting the filtering coefficients is conducted such that the filtering coefficients minimize an error metric constructed for the display device, wherein the error metric represents the color error and luminance error of the display device.

8. A method as recited in claim 7, wherein the error metric is parameterized, such that the error metric can be adjusted for a desired degree of color accuracy and a desired degree of luminance accuracy by selecting the value of the parameters.

9. A method as recited in claim 6, wherein the step for selecting the filtering coefficients is conducted such that the filtering coefficients approximate the filtering coefficients of an optimized filter that minimizes an error metric constructed for the display

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device, wherein the error metric represents the color error and luminance error of selected portions of the display device.

10. A method as recited in claim 1, further comprising the act of rotating the signal in color space, such that the color of the image, which is originally expressed in the signal in terms of R,G, and B, is subsequently expressed in terms of Y, U, and V.

11. A method as recited in claim 1, further comprising the step for generating a separate luminous intensity value for each of the pixel sub-components based on the data representing the spatially different region of image data mapped thereto.

12. A method as recited in claim 11, further comprising the step for displaying the image on the display device using the separate luminous intensity values, resulting in each of the pixel sub-components of the pixels, rather than the entire pixels, representing different portions of the image.

13. A method as recited in claim 1, wherein the image represents text characters, the step for passing the signal through the low-pass filter and the step for generating the data structure being conducted to generate text character data stored in a font glyph cache, the method further comprising the step for assembling and displaying a document using the text character data stored in the font glyph cache.

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14. In a processing device associated with a display device, wherein the display device has a plurality of pixels each having a plurality of pixel sub-components, a method of displaying an image on the display device such that the pixel sub-components represent different portions of the image and the image is rendered with a desired degree of luminance accuracy and a corresponding desired degree of color accuracy, the method comprising the acts of:

filtering a signal in which the image data is encoded using a set of filters that includes first through ninth filters, including:

filtering the signal to obtain a first sample to be mapped to a first pixel sub-component of a particular pixel, including passing a first channel of the signal through the first filter, a second channel through the second filter, and a third channel through the third filter;

filtering the signal to obtain a second sample to be mapped to a second pixel sub-component of the particular pixel, including passing the first channel through the fourth filter, the second channel through the fifth filter, and the third channel through the sixth filter; and

filtering the signal to obtain a third sample to be mapped to a third pixel sub-component of the particular pixel, including passing the first channel through the seventh filter, the second channel through the eighth filter, and the third channel through the ninth filter; and

generating a data structure that includes data representing the luminous intensity values assigned to the pixel sub-components of the pixel based on the first, second, and third samples mapped to the pixel sub-components.

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15. A method as recited in claim 14, wherein each of the filters corresponds to one of the plurality of channels and to one of the plurality of pixel sub-components of the particular pixel, and filters the corresponding channel in a region of the image data that is centered generally about the corresponding pixel sub-component.

16. A method as recited in claim 15, wherein at least two of the filters that correspond to one of the plurality of channels overlaps with respect to spatial location.

17. A method as recited in claim 14, further comprising the step for selecting the filtering coefficients of the filters to establish a desired tradeoff between color accuracy and luminance accuracy.

18. A method as recited in claim 17, wherein the step for selecting the filtering coefficients is conducted such that the filtering coefficients minimize an error metric constructed for the display device, wherein the error metric represents the color error and luminance error of a portion of the display device that includes the particular pixel.

19. A method as recited in claim 18, wherein the error metric is parameterized, such that the error metric can be adjusted for a desired degree of color accuracy and a desired degree of luminance accuracy by selecting the value of the parameters.

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20. In a processing device associated with a display device, wherein the display device has a plurality of pixels each having a plurality of pixel sub-components, a method of displaying an image on the display device such that the pixel sub-components represent different portions of the image and the image is rendered with a desired degree of luminance accuracy and a corresponding desired degree of color accuracy, the method comprising the steps for:

passing a signal in which the image data is encoded through a plurality of low-pass filters, the signal having a plurality of channels each representing a different color component of the image, the plurality of filters including filters having filtering coefficients that have been selected to at least approximate the coefficients of optimized filters that minimize an error metric constructed for the display device; and

based on the filtered signal, generating a data structure in which data representing spatially different regions of the image data are mapped to individual pixel sub-components of a particular pixel rather than being mapped to the entire pixel.

21. A method as recited in claim 20, wherein the plurality of filters includes only one filter for each of the plurality of pixel sub-components of the particular pixel.

22. A method as recited in claim 20, wherein the plurality of filters includes a number of filters equal to the product obtained by multiplying the number of channels included in the plurality of channels and the number of pixel sub-components included in the plurality of pixel sub-components of the particular pixel.

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23. A method as recited in claim 20, wherein the error metric is selected to establish a desired tradeoff between color accuracy and luminance accuracy, and wherein the error metric represents the color error and luminance error of a selected portion of the display device.

24. A method as recited in claim 23, wherein the error metric is parameterized, such that the error metric can is adjustable for a desired degree of color accuracy and a desired degree of luminance accuracy by selecting the value of the parameters.

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25. A computer system for displaying an image encoded in a signal with a desired degree of luminance accuracy and a corresponding desired degree of color accuracy, the computer system comprising:

a processing unit;

a display device operably coupled with the processing unit, the display device including a plurality of pixels, each of the plurality of pixels including a plurality of separately controllable pixel sub-components; and

a plurality of filters for obtaining samples that map spatially different regions of the image to individual pixel sub-components of a particular pixel, the plurality of filters including filters having filtering coefficients that have been selected to at least approximate the coefficients of optimized filters that minimize an error metric constructed for the display device.

26. A computer system as recited in claim 25, wherein the plurality of filters includes a number of filters equal to the product obtained by multiplying the number of channels included in the plurality of channels and the number of pixel sub-components included in the plurality of pixel sub-components of the particular pixel.

27. A computer system as recited in claim 25, wherein the plurality of filters includes only one filter for each of the plurality of pixel sub-components of the particular pixel.

28. A computer system as recited in claim 25, wherein the error metric is selected to establish a desired tradeoff between color accuracy and luminance accuracy.

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29. A computer system as recited in claim 28, wherein the error metric is parameterized, such that the error metric can is adjustable for a desired degree of color accuracy and a desired degree of luminance accuracy by selecting the value of the parameters.

30. A computer system as recited in claim 25, wherein the plurality of filters includes a subset of filters corresponding to each of the pixel sub-components of a particular pixel, the subset of filters being spatially centered generally about the particular pixel sub-component that corresponds thereto.

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31. A computer program product for implementing, in a processing device associated with a display device that includes a plurality of pixels each having a plurality of pixel sub-components, a method of displaying an image on the display device such that the pixel sub-components represent different portions of the image and the image is rendered with a desired degree of luminance accuracy and a corresponding desired degree of color accuracy, the computer program product comprising:

a computer-readable medium carrying computer-executable instructions for implementing the method, the computer-executable instructions including:

program code means for obtaining data that maps spatially different regions of image data to individual pixel sub-components of a particular pixel, the image data including a plurality of channels each representing a different color component of the image, the program means for obtaining data including:

program code means for linearly filtering each of the plurality of channels using filtering coefficients that have been selected to at least approximate the coefficients of optimized filters that minimize an error metric constructed for the display device; and

program code means for mapping the resulting filtered data to the corresponding individual pixel sub-components.

32. A computer program product as recited in claim 31, wherein the program code means for linearly filtering comprises a plurality of filters applied to a particular pixel, the plurality of filters including a number of filters equal to the product obtained by multiplying the number of channels included in the plurality of channels and the number of

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pixel sub-components included in the plurality of pixel sub-components of the particular pixel.

33. A computer program product as recited in claim 31, wherein the program code means for linearly filtering comprises a only one filter for each of the plurality of pixel sub-components of the particular pixel.

34. A computer program product as recited in claim 31, wherein the error metric is selected to establish a desired tradeoff between color accuracy and luminance accuracy, and wherein the error metric represents the color error and luminance error of a portion of the display device.

35. A computer program product as recited in claim 34, wherein the error metric is parameterized, such that the error metric can is adjustable for a desired degree of color accuracy and a desired degree of luminance accuracy by selecting the value of the parameters.

36. A computer program product as recited in claim 31, wherein the computer-executable instructions further comprise program code means for generating a separate luminous intensity value for each of the pixel sub-components based on the sample mapped thereto.

37. A computer program product as recited in claim 37, wherein the computer-executable instructions further comprise program code means for displaying the image on

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the display device using the separate luminous intensity values, resulting in each of the pixel sub-components of the particular pixel representing different portions of the image.

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